

Table 1 - Water to Plaster Mixing Chart

Water (Gallons)	No. 1 Pottery Plaster (lb.)	End Product Volume (Cub. inch.)
8.34	100	2300
4.17	50	1150
3.75	45	1035
3.34	40	920
2.92	35	805
2.5	30	690
2.09	25	575
1.67	20	460
1.25	15	345
0.83	10	230
0.42	5	115
0.25 (2 pints)	3	69
0.16 (21.4 oz.)	2	46
0.08 (10.7 Oz.)	1	23

The above table is based on USG® No. 1 Pottery Plaster mixed to a consistency of 70 (70 parts plaster to 100 parts water) recommended for most studio applications. Excessive water yields a more porous but more brittle mold, and less water means a very dense, hard mold that will not absorb water.

Add plaster to water. Slowly sift the plaster onto the surface of the water. Do not dump the plaster or toss it in by handfuls. Adding the plaster shouldn't take more than 3 minutes.

Soak the plaster. It is important to let the plaster slake. Slaking is the process of leaving the plaster in the bucket with the water to let the plaster itself eliminate air bubbles by soaking. I would usually wait 3-4 minutes depending on the water temperature. The soaking allows each plaster crystal to be completely surrounded by water and it removes air from the mix. Small batches require less soaking than large batches. If the soaking time is too short, it may contribute to pinholes; and if it is too long, it will contribute to fast set times, early stiffening and gritty surfaces.

Mix the plaster. Mixing the plaster slurry is the most important step in producing plaster molds or casts with maximum strength, absorption, hardness and other important properties. Changes in mixing procedures will have a great effect on the finished product. The basic objective is to uniformly and simultaneously wet each particle as best as practical. [Where to purchase mixing blade](#)

When plaster is wet, a chemical reaction is occurring which produces heat. **Protect your hands with gloves.** Set-up time is affected by water-to-plaster ratio (less water = faster set-up but decreased strength). Temperature of water (warm = faster set-up), and speed and length of mixing (long/rough agitation = faster set-up). Set-up should be at room temperature without fans or drafts. To facilitate clean up, the mixing container may be treated with WD-40 or other release agents. Use a constant motion with your hand and you will notice a change in consistency from watery to a thick cream. Breakdown lumps with your fingers as you mix. Mix only for a minute or two being very careful not to agitate the mixture so much that air bubbles are incorporated into the mix. Mixing time affects absorption rates longer mixing times produce tighter and less-absorptive molds.

Manual Mixing (not generally suitable for batches over 5 pounds) - using a spoon or wood trowel, mix from the bottom using a side to side motion. Circular motion will cause bubbles. Mix to the consistency of heavy cream.

Electric Mixer - Use an electric drill with a "Jiffy Mixer" or equivalent attachment. "Stir" at no more than 1750 RPM while holding the Jiffy Mixer at 15 degrees off vertical.

The mixing container should be solidly tapped or even dropped on the floor several times to help air bubbles rise to the top.

The plaster is ready to pour when mixing is complete. "Marking" is a way to determine when it is ready - when a finger is trailed over the surface of the plaster and a slight mark is left in the plaster.

Air bubbles Use Isopropyl alcohol (rubbing alcohol) in an old spray bottle. When the time is nearing completion for mixing shoot in a couple of spray bursts. This has the effect of breaking the surface tension of the bubbles at the surface and you'll see them disappear.

Pouring the mix. Pouring should be done in a comfortably quick, smooth, steady manner directed towards the center of the base of the wedging board frame. Shake the table with and pour into a corner of the wooden frame cavity that will not be threatened as much by bubbles that don't make it up in the

shaking process. After the pour is made shaking the table a little more sharply and/or vigorously will help bubbles up. After the pour, another spritz of Isopropyl will help eliminate surface bubbles again.

If water rises to the surface after the pour, the plaster has not mixed sufficiently or the water to plaster ratio is incorrect. Mix longer, check your calculations or review the ratio.

- Batch size should allow for the pouring to be completed within 5 minutes after the slurry has been mixed.

- If strength is the most important factor, longer mixing times are suggested, taking care not to over mix into the setting action of the plaster, which decreases strength.

Clean up. It is much easier to clean wedging table frame, tools and floor from plaster spills and over flow within the plaster's curing time (15-20 minutes). Do so with damp rags. If you miss this window of opportunity, you'll have to deal with scraping and sanding. Bucket can be cleaned the next day when the plaster is cure by taping on the bucket letting the dry plaster break off the walls.

Drying time. Depends on air humidity, newly made wedging table should not be used for 2-3 weeks to let the plaster dry completely before use. Drying time may vary depending on environment's humidity.

Safety and environmental concerns - When mixed with water, this material hardens and becomes very hot - sometimes quickly. DO NOT attempt to make a cast enclosing any part of the body using this material. Control and suppress dust formation, prevent powder or slurry contaminating drains and watercourses. Minimize and control dust when opening bags, mixing powder with water or sanding set plasters. Avoid prolonged or repeated contact with the skin or any eye contact. Wear protective clothing and gloves when mixing or working with powdered or wet plasters. If plaster contact or splashes are likely wear safety goggles. Gypsum based preparations are not known to have high potential to damage the environment. No known available evidence indicating adverse toxicological health effects for acute toxicity, corrosivity/irritation, sensitization, repeated-dose toxicity, mutagenicity, carcinogenicity, or reproductive toxicity. Inhalation – Plaster dust may irritate respiratory system, no known long term effects. Ingestion- Small amounts of plaster or wet mix should not cause any significant reaction or long term effect. Skin contact- Plaster powder may dry skin leading to irritation if contact is prolonged or skin is sensitive. Eye contact – Powder or wet mix splashes may irritate by particulate in the short term.